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No. L.

*Observations to serve for the Mineralogical Map of the State of Maryland. By M. Godon.*

Read November 6th, 1807.

ALLUVION SOIL.

All the country which extends from Baltimore bay, to the right bank of Potomac river, where Washington city is situate, is wholly alluvial. The soil which constitutes it is, in general, a *quartzose* sand, diversly coloured by iron. This sand very frequently contains *mica*; *aluminous* earth also appears to exist in it, in a very small proportion. It is probably to the want of a sufficient quantity of clay in this alluvial ground, that the remarkable barrenness of the land which stretches on the line that I have occasionally travelled, must be attributed.

At some distance under the surface of the soil, a bed of quartzose white stones is frequently found. This bed is horizontally disposed, or appears to follow the inequality of the ground.

Immediately under this bed of flint, a stratum of a ferruginous sand-stone commonly occurs, the thickness whereof varies from six lines to one foot or more. This mineral, the only one which is found, or which can be expected to be found in this soil, deserves a particular examination, on account of its importance as it regards the geology of this locality. It is most commonly compounded of quartzose grains; sometimes of flakes of mica. Its tenacity at times is very great, but most frequently it is disunited with ease by the stroke of the hammer.

It sometimes includes concretions of a strongly ferruginous clay, analogous to those stones, which, though a variety of iron ore, are vulgarly known by the name of *ætues*, or *eagle-stone*. These concretions are almost always involved in thin con-

centric strata of *oxydated iron*, (*hematites*) which are sometimes shining. Federal Hill, near Baltimore, affords on its flanks numerous examples of this variety. When the grains of which this sand-stone is formed are of great tenuity, they take the appearance and characters of *Tripoli*, and probably may be employed for the same uses;\* such is that found on a new road, which communicates with the Frederick road, two miles from Baltimore. This last variety very frequently accompanies a small bed of oxydated iron, which is cellular, sometimes two inches thick; but, most frequently, this iron forms only a thin pellicle, which exhibits the colours of the iris.

This sand-stone is found on the top of almost every hill that occurs on the road from Baltimore to Washington; it is easily observed in the places where the soil has been washed away by floods, or cut down for public roads.

Sometimes the bed of quartzose stones has been itself agglutinated by a ferruginous cement, and constitutes a sort of pudding-stone. This pudding-stone is often found of the thickness of one or two feet.

The rocks of *transport*, which are found in this soil are, in general, the *Amphibolic* rock, (*grunstein* of the Germans) a coarse quartz, and the variety of quartz designated by Werner, under the name of *Hornstein*.

Some fossil bodies are also found in this soil, namely, some remains of shells, and particularly a deposit of fossil wood, which is observed in a ravine at a little distance from Rock-Creek church. This wood lies immediately under the ferruginous sand-stone, in which it is sometimes, as it were, enveloped. It appears that the ligneous particles of this wood, have been wholly replaced by siliceous earth; the parts in which were interstices, as the bark for example, are covered with a multitude of small crystals of quartz, which belong to the variety *prismed* of Hauy.

All these sand-stones and ferruginous puddings, seem to have a common origin. When the limits of this stratum shall have been observed, and the space which it occupies shall have

\* To polish metals and hard stones.

been traced, we shall perhaps have some light thrown on the circumstances which have produced it; and perhaps it will even be possible to form some hypothesis concerning the origin of this vast deposit of sand, which is observed through the space of 50 miles, in the direction from North-East to South-West,\* and which appears to be much more extensively in the direction from East to West.

Washington city is built on the alluvial land; but Rock-Creek, which separates this capital from George-town, appears to present the boundary line between the primitive and the alluvial soil.

### PRIMITIVE SOIL.

The first rock which presents itself must be considered as a *gneiss*; its direction is nearly N. N. E. to S. S. W. Or inclining about 20 degrees to the East. The substances which compose it are *quartz*, *felspar*, *mica*, and very often *talc*. The mica and the talc have the grey colour of lead; but this last is sometimes distinguished by the green colour of the emerald. Besides those substances, the *gneiss* often contains the *dodecahedral garnet*, commonly in small crystals, but some are four or five lines in diameter, and *sulphureted magnetic iron* crystallized in small cubes. This mineral sometimes exists so abundantly that every part of the rock is sensible to the magnet. Considerable veins of quartz run through the rock, without any constant direction; the veins of felspar are more rare. This *gneiss* crosses the Potomac river, and in the opposite bank of this river observes the same direction, the same inclination in the strata, and the same elements in their composition. This rock is generally split into tabular fragments, which are employed in the construction of the foundation of buildings, and in the lining of causeways.

Immediately after the *gneiss*, in going up the river, we find the *Amphibolic rock*, (*grunstein*;) this rock is not uniform in its composition, most frequently it is an aggregate of *Amphibol*, (*hornblende*) and *felspar*, then it is nearly decomposed;

\* The primitive soil appears near Baltimore, and it is manifest in the valley through which the Patapsco river flows.

but it appears to be only an intimate mixture of quartz, amphibol, mica, and talc, which shows itself by its green colour. This rock often includes the *sulphureted* magnetic iron. The tint of this pyrites resembling that of copper pyrites, and light spots even of carbonate of copper, indicate that this mineral conceals a small proportion of copper. This rock, as the former, is crossed in several directions by veins of quartz, sometimes more than two feet thick. A distinct stratification is not observed in it; it is divided into polyhedral fragments.

In continuing up the Potomac, at a little distance from George-town, *gneiss* is again found, analogous in its nature to that already described. The inclination of these new strata, appears to be the same, but their direction somewhat nearer to that of the North and South. This *gneiss* shows some veins of white felspar, mixed with a mica of a greenish white, but the opaque white quartz, exists in numerous, and powerful veins. This quartz is sterile in metallic substances; some signs of *oxidulated* iron only and of *magnetic pyrites* are found in it. This quartz is sometimes accompanied by the *chloritic talc*, and pretty often includes the *tourmalin* in small acicular crystals. Sometimes the quartz presents a large surface covered with a crust of a fine black substance; at first sight, this matter would be taken for manganese, but by attentive observation, it appears to be nothing more than the substance of *tourmalin* itself, in a state of confused crystallization.

You go up the Potomac river to the little falls, four miles above Washington, without finding any remarkable change in the constitution of the *gneiss*. This rock also crosses the river, and you may observe, on both the banks, the same disposition in the strata, and the same characters. The vegetable earth, which covers the tops of steep hills on the left side, is nothing but the *gneiss* itself in a state of decomposition, which is capable of being turned up by the plough; and the fields are covered by numerous fragments of quartz, which have suffered no alteration.

The two beds of *gneiss* which are distinctly observed, on the right bank of Potomac river, and which are separated on this side by the *Amphibolic* rock, appear to be re-united on the left

bank. I expected to find the grunstein again in this last, but I found only some fragments of this rock—an insufficient proof to justify an inference, that these rocks extend beyond the bed of the river.

We find, in the bed of the Potomac river, several fragments of rocks, which indicate a change in the constitution of the soil running along the upper part of the river: among these fragments is particularly distinguished an *amygdaloid* (wacke of the Germans) of a dark colour, including globules of a substance sometimes white, sometimes of a fine rose-colour. In the centre of these globules, another substance of a fibrous texture, and of a fine green colour often occurs. This substance seems to be the *epidote*. These several substances are disposed in the rock, in a very elegant manner.

Specimens of most of the minerals mentioned in this memoir, are deposited in the collection of the Philosophical Society of Philadelphia.

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## No. LI.

*Memoir on the origin and composition of the meteoric stones which fell from the Atmosphere, in the County of Fairfield, and State of Connecticut, on the 14th of December 1807; in a Letter, dated February 18th 1808, from Benjamin Silliman, Professor of Chemistry in Yale College, Connecticut, and Mr. James L. Kingsley, to Mr John Vaughan, Librarian of the American Philosophical Society.*

Read March 4th, 1808.

SIR,

We transmit, through you, to the Philosophical Society of Philadelphia, a revised, corrected, and somewhat enlarged account of the meteor which lately appeared in this vicinity. The substance of this account was first published in the Connecticut Herald, as public curiosity demanded an early statement of facts. Since that, the stone has been carefully